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SHOOK, HARDY & BACON L.L.P.
CHASE TOWER, SUITE 1600
600 TRAVIS STREET
HOUSTON, TX 77002-2911

EXAMINER	
MCCARTNEY, LINZY T	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/936,682	Applicant(s) ACOSTA ET AL.	
	Examiner Linzy McCartney	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27,33-37 and 43* is/are rejected.

7)☒ Claim(s) *28-32,38 and 42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 May 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-9 and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oil & Gas Journal "Texaco E&P Center Allows Visual Probe of 3D Data Volumes" (Oil & Gas Journal) in view of U.S. Patent No 5,734,384 to Yanof et al. (Yanof) further in view of U.S. Patent No. 4,984,157 to Cline et al (Cline).

a. Referring to claim 1, Oil and Gas Journal discloses creating at least one three-dimensional sampling probe, wherein said three-dimensional sampling probe is the same size or a subset of said three dimensional data volume, said three-dimensional sampling probe having a probe face in a probe face plane and an opposing probe face in an opposing probe face plane (page 46, column 1, paragraph 2; page 47, image).
Oil & Gas Journal does not explicitly disclose: producing a plurality of control points in said probe face plane, said plurality of control points defining one or more lines on said probe face plane; extending a ribbon section from said probe face plane toward said opposing probe face plane, one edge of said ribbon section being formed by said one or more lines; selectively imaging datawords representative of said physical phenomena **only** at three-dimensional locations which intersect said ribbon section and said three dimensional sampling probe. Yanof discloses producing a plurality of control points in

said probe face plane, said plurality of control points defining one or more lines on said probe face plane (column 13, lines 5-23 and Fig. 6C); extending a ribbon section from said probe face plane toward said opposing probe face plane, one edge of said ribbon section being formed by said one or more lines (column 13, line 64 – column 14, line 9); selectively imaging datawords representative of said physical phenomena at three-dimensional locations which intersect said ribbon section and said three dimensional sampling probe (column 14, lines 6-9). Cline discloses only imaging datawords only at intersecting locations (column 10, lines 52-68). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22) and to display a three-dimensional array of physical values in two-dimensional cross section taken in a selectable viewing plane (Cline, column 3, 46-49).

b. Referring to claim 2, Oil & Gas Journal does not explicitly disclose editing said plurality of control points in said probe face plane to thereby redefine said one or more lines; and extending another redefined ribbon section from said probe face plane toward said opposing probe face plane. Yanof discloses editing said plurality of control points in said probe face plane to thereby redefine said one or more lines (column 13, lines 18-23); and extending another redefined ribbon section from said probe face plane toward said opposing probe face plane (column 13, line 64 – column 14, line 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to

modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

c. Referring to claim 3, Oil & Gas Journal does not explicitly disclose deleting one or more of said plurality of control points. Yanof discloses deleting one or more of said plurality of control points (column 13, lines18-23). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

d. Referring to claim 4, Oil & Gas Journal does not explicitly disclose changing a location of one or more of said plurality of control points. Yanof discloses changing a location of one or more of said plurality of control points (column 13, lines18-23) At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

e. Referring to claim 5, Oil & Gas Journal does not explicitly disclose adding one or more control points to said plurality of control points. Yanof discloses adding one or more control points to said plurality of control points (column 13, lines18-23). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The

suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

f. Referring to claim 6, Oil & Gas Journal does not explicitly disclose said ribbon section is perpendicular to said probe face plane. Yanof discloses said ribbon section is perpendicular to said probe face plane (column 13, line 64 – column 14, line 9; Fig. 6F). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

g. Referring to claim 7, Oil & Gas Journal does not explicitly disclose said ribbon section extends from said probe face plane to said opposing probe face plane. Yanof discloses said ribbon section extends from said probe face plane to said opposing probe face plane (column 13, line 64 – column 14, line 9; Fig. 6F). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

h. Referring to claim 8, Oil & Gas Journal does not explicitly disclose wherein said one or more lines comprise a plurality of straight lines. Yanof discloses wherein said one or more lines comprise a plurality of straight lines (Fig. 6F). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The

suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

i. Referring to claim 9, Oil & Gas Journal does not explicitly disclose wherein said one or more lines form a closed line. Yanof discloses wherein said one or more lines form a closed line (Fig 6). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

j. Referring to claim 12, Oil and Gas Journal discloses displaying a plane within said three dimensional volume; (page 46, column 1, paragraph 2; page 47, image). Oil & Gas Journal does not explicitly disclose producing a plurality of control points in said plane, said plurality of control points defining one or more lines on said plane; extending a ribbon section from said plane, one edge of said ribbon section being formed by said one or more lines; selectively imaging datawords representative of said physical phenomena **only** at three-dimensional locations which intersect said ribbon section and said three dimensional sampling volume.Yanof discloses producing a plurality of control points in said plane, said plurality of control points defining one or more lines on said plane (column 13, lines 5-23 and Fig. 6C); extending a ribbon section from said plane, one edge of said ribbon section being formed by said one or more lines (column 13, line 64 – column 14, line 9); selectively imaging datawords representative of said physical phenomena at three-dimensional locations which intersect said ribbon section and said

three dimensional sampling volume (column 14, lines 6-9). Cline discloses only imaging datawords only at intersecting locations (column 10, lines 52-68). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22) and to display a three-dimensional array of physical values in two-dimensional cross section taken in a selectable viewing plane (Cline, column 3, 46-49)..

k. Referring to claim 13, Oil & Gas Journal does not explicitly disclose editing said plurality of control points in said plane to thereby redefine said one or more lines; and extending another redefined ribbon section from said plane toward an opposing plane. Yanof discloses editing said plurality of control points in said plane to thereby redefine said one or more lines (column 13, lines 18-23); and extending another redefined ribbon section from said plane toward an opposing plane (column 13, line 64 – column 14, line 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

l. Referring to claim 14, Oil & Gas Journal does not explicitly disclose deleting one or more of said plurality of control points. Yanof discloses deleting one or more of said plurality of control points (column 13, lines18-23). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure

of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

m. Referring to claim 15, Oil & Gas Journal does not explicitly disclose changing a location of one or more of said plurality of control points. Yanof discloses changing a location of one or more of said plurality of control points (column 13, lines18-23) At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

n. Referring to claim 16, Oil & Gas Journal does not explicitly disclose adding one or more control points to said plurality of control points. Yanof discloses adding one or more control points to said plurality of control points (column 13, lines18-23). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

o. Referring to claim 17, Oil & Gas Journal does not explicitly disclose said ribbon section is perpendicular to said plane. Yanof discloses said ribbon section is perpendicular to said plane (column 13, line 64 – column 14, line 9; Fig. 6F). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The

suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

p. Referring to claim 18, Oil & Gas Journal does not explicitly disclose said ribbon section extends from said plane to an opposing plane. Yanof discloses said ribbon section extends from said plane to an opposing plane (column 13, line 64 – column 14, line 9; Fig. 6F). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

q. Referring to claim 19, Oil & Gas Journal does not explicitly disclose wherein said one or more lines comprise a plurality of straight lines. Yanof discloses wherein said one or more lines comprise a plurality of straight lines (Fig. 6F). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

r. Referring to claim 20, Oil & Gas Journal does not explicitly disclose wherein said one or more lines form a closed line. Yanof discloses wherein said one or more lines form a closed line (Fig 6). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Yanof. The suggestion/motivation for doing so would have

been to exclude unwanted, obscuring structures from the reprojection (Yanof, column 4, lines 13-22).

3. Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oil & Gas Journal in view of Yanof as applied to claims 1 and 12 above further in view of Magic Earth Brochure, "Does Your 3D Interpretation Software Move As Fast As You Do? GeoProbe Does" (Magic Earth Brochure).

a. Referring to claim 10, the modified method of Oil & Gas Journal does not explicitly dislose wherein said ribbon section is comprised of a plurality of planes . Magic Earth Brochure discloses wherein said ribbon section is comprised of a plurality of planes (page 2, bottom right image). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Magic Earth Brochure. The suggestion/motivation for doing so would have been to provide a 3-D visualization method that allows user to interactively visualize and interpret enormous data volumes (Magic Earth Brochure, page 2, middle column)

b. Referring to claim 21, the modified method of Oil & Gas Journal does not explicitly disclose wherein said ribbon section is comprised of a plurality of planes. Magic Earth Brochure discloses wherein said ribbon section is comprised of a plurality of planes (page 2, bottom right image). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of Magic Earth Brochure. The suggestion/motivation for doing so would have been to provide a 3-D visualization method that allows user to

interactively visualize and interpret enormous data volumes (Magic Earth Brochure, page 2, middle column)

4. Claims 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oil & Gas Journal in view of Yanof as applied to claims 1 and 12 above further in view of U.S. Patent No. 4,984,157 to Cline et al (Cline).

a. Referring to claim 11, the modified method of Oil & Gas Journal as applied to claim 1 above discloses said three-dimensional probe has a plurality of side faces perpendicular to said probe face plane (Oil & Gas Journal, page 46, column 1, paragraph 2; page 47, image). The modified method of Oil & Gas Journal does not explicitly disclose said ribbon section being unparallel with respect to each of said plurality of side faces. Cline discloses said ribbon section being unparallel with respect to each side of said plurality of side faces (Fig. 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the disclosure of Oil & Gas Journal with the teachings of Cline. The suggestion/motivation for doing so would have been to display a three-dimensional array of physical values in two-dimensional cross section taken in a selectable viewing plane (Cline, column 3, 46-49).

b. Referring to claim 22, the modified method of Oil & Gas Journal as applied to claim 12 above discloses said three-dimensional probe has a plurality of side faces perpendicular to said probe face plane (Oil & Gas Journal, page 46, column 1, paragraph 2; page 47, image). The modified method of Oil & Gas Journal does not explicitly disclose said ribbon section being unparallel with respect to each of said plurality of side faces. Cline discloses said ribbon section being unparallel with respect to each side of

said plurality of side faces (Fig. 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the disclosure of Oil & Gas Journal with the teachings of Cline. The suggestion/motivation for doing so would have been to display a three-dimensional array of physical values in two-dimensional cross section taken in a selectable viewing plane (Cline, column 3, 46-49).

5. Claims 23-27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oil & Gas Journal in view of WO 00/14574.

a. Referring to claim 23, Oil & Gas Journal discloses positioning a face of a probe at a first position within said three-dimensional data volume (page 46, column 1, paragraph 2; page 47, image). Oil & Gas Journal does not explicitly disclose forming a first set of control points on said face of said probe for tracking a physical phenomena described by said three-dimensional data volume, said first set of control points defining a first spline curve; moving said face of said probe to a second position within said three-dimensional volume; forming a second set of control points on said face of said probe for tracking said physical phenomena, said second set of control points defining a second spline curve; interpolating between said first spline curve and second spline curve to define a three-dimensional surface representative of said physical phenomena WO 00/14574 discloses forming a first set of control points on said face of said probe for tracking a physical phenomena described by said three-dimensional data volume, said first set of control points defining a first spline curve (page 13, paragraph 1); moving said face of said probe to a second position within said three-dimensional volume (page 13, paragraph 1); forming a second set of control points on said face of said probe for tracking said

physical phenomena, said second set of control points defining a second spline curve (page 13, paragraph 1); interpolating between said first spline curve and second spline curve to define a three-dimensional surface representative of said physical phenomena (page 12, paragraph 2 – page 13, paragraph 1; Figure 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph 2).

b. Referring to claim 24, Oil & Gas Journal does not explicitly disclose displaying the surface representative of said physical phenomena, said surface intersecting said first set of control points and said second set of control points. WO 00/14574 discloses displaying the surface representative of said physical phenomena, said surface intersecting said first set of control points and said second set of control points (Fig. 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph 2).

c. Referring to claim 25, Oil & Gas Journal does not explicitly disclose interpolating between said first set of control points to define said first spline curve and interpolating between said second set of control points to define said second spline curve, at least one of said first spline curve and said second spline curve being curvilinear. WO 00/14574

discloses interpolating between said first set of control points to define said first spline curve and interpolating between said second set of control points to define said second spline curve, at least one of said first spline curve and said second spline curve being curvilinear (page 12, paragraph 2 – page 13, paragraph 1; Figure 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph 2).

d. Referring to claim 26, Oil & Gas Journal does not explicitly disclose moving said face of said probe to a third position within said three dimensional volume; forming a third set of control points on said face of said probe for tracking said physical phenomena, said third set of control points defining a third spline curve; and interpolating between said first spline curve and second spline curve, and said third spline curve for enlarging said surface. WO 00/14574 discloses forming a first set of control points on said face of said probe for tracking a physical phenomena described by said three-dimensional data volume, said first set of control points defining a first spline curve (page 13, paragraph 1); moving said face of said probe to a second position within said three-dimensional volume (page 13, paragraph 1); forming a second set of control points on said face of said probe for tracking said physical phenomena, said second set of control points defining a second spline curve (page 13, paragraph 1); interpolating between said first spline curve and second spline curve to define a three-dimensional surface representative of said physical phenomena (page 12, paragraph 2 – page 13, paragraph 1;

Figure 4). WO 00/14574 does not explicitly disclose moving said probe to a third position within said three dimensional volume, forming a third set of control points on said face of probe, and interpolating between said first spline curve, said second spline curve, and said third spline curve. However, it would have been obvious to a person of ordinary skill in the at the time the invention was made to move said probe to a third position, form a third set of control points, and interpolate between said first spline curve, said second spline curve and said third spline curve because WO 00/14574 discloses that if the planned well path extends outside the volume window moving the volume window, adding control points, creating a new spline curve based on the old curve and the new control points (page 12, paragraph 2 – page 3, paragraph 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph 2).

e. Referring to claim 27, Oil & Gas Journal does not explicitly disclose editing at least one of said first set of control points and said second set of control points. (WO 00/14574 discloses editing at least one of said first set of control points and said second set of control points (page 12, paragraph 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph 2).

f. Referring to claim 33, Oil & Gas Journal does not explicitly disclose forming a third set of control points on said face of said probe at said first position, said third set of control points defining a third spline curve; forming a fourth set of control points on said face of said probe at said second position, said fourth set of control points defining a fourth spline curve; interpolating between said third spline curve and said fourth spline curve to define another three-dimensional surface representative of another physical phenomena described by said three-dimensional data volume, said three-dimensional surface and said another three-dimensional surface being defined substantially at the same time. WO 00/14574 does not explicitly disclose forming a third set of control points on said face of probe at said first position and forming a fourth set of control points on said face of probe at said second position, and interpolating between said third spline curve and said fourth spline curve. However, it would have been obvious to a person of ordinary skill in the at the time the invention was made to form a third set of control points on said face at said first position and form a fourth set of control points at a second position, and interpolate between said third spline curve and said fourth spline curve because WO 00/14574 discloses that if the planned well path extends outside the volume window moving the volume window, adding control points, creating a new spline curve based on the old curve and the new control points (page 12, paragraph 2 – page 3, paragraph 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to

provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph 2).

6. Claims 34-37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oil & Gas Journal in view of WO 00/14574.

a. Referring to claim 34, Oil & Gas Journal discloses positioning a plane at a plurality of plane positions within said three-dimensional data volume (page 46, column 1, paragraph 2). Oil & Gas Journal does not explicitly disclose forming a set of control points at each of said plurality of plane positions such that each of said set of control points defines a related spline curve; and interpolating between each of said spline curves to form a surface representative of a physical phenomena described by said three-dimensional data volume. WO 00/14574 discloses forming a set of control points at each of said plurality of plane positions such that each of said set of control points defines a related spline curve (page 13, paragraph 1) and interpolating between each of said spline curves to form a surface representative of a physical phenomena described by said three-dimensional data volume (page 12, paragraph 2 – page 13, paragraph 1; Fig. 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph 2).

b. Referring to claim 35, Oil & Gas Journal does not explicitly disclose displaying the surface representative of said physical phenomena, said surface intersecting each of said set of control points. WO 00/14574 discloses displaying the surface representative of

said physical phenomena, said surface intersecting each of said set of control points (Fig. 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph).

c. Referring to claim 36, Oil & Gas Journal does not explicitly disclose interpolating between each of said set of control points to define said related spline curves, at least one of said related spline curves being curvilinear. WO 00/14574 discloses interpolating between each of said set of control points to define said related spline curves, at least one of said related spline curves being curvilinear (page 12, paragraph 2 – page 13, paragraph 1; Fig. 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph).

d. Referring to claim 37, Oil & Gas Journal does not explicitly disclose editing one or more of said control points. WO 00/14574 discloses editing one or more of said control points (page 12, paragraph 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so

would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph).

e. Referring to claim 43, Oil & Gas Journal does not explicitly disclose forming another set of control points at each of said plurality of plane positions, such that each of said another set of control points defines another related spline curve; and interpolating between each of said another spline curves to form another surface representative of another physical phenomena described by said three dimensional data volume, said surface and another surface being formed substantially at the same time. WO 00/14574 discloses forming another set of control points at each of said plurality of plane positions, such that each of said another set of control points defines another related spline curve (page 12, paragraph 2 – page 13, paragraph 1; Fig. 4); and interpolating between each of said another spline curves to form another surface representative of another physical phenomena described by said three dimensional data volume, said surface and another surface being formed substantially at the same time (page 12, paragraph 2 – page 13, paragraph 1; Fig. 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the disclosure of Oil & Gas Journal with the teachings of WO 00/14574. The suggestion/motivation for doing so would have been to provide a method for interactive well planning in a virtual environment (WO 00/14574, page 12, paragraph).

Allowable Subject Matter

7. Claims 28-32 and 38-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Amendment

8. The 37 C.F.R. 1.131 Declaration filed on 15 September 2003 under 37 CFR 1.131 has been considered but is ineffective to overcome the WO 00/14574 reference.

9. The evidence submitted is insufficient to establish a reduction to practice of the invention in this country or a NAFTA or WTO member country prior to the effective date (16 March 2000) of the reference. The evidence submitted is insufficient because it appears to be merely code comments, not the source code that carries out the method described in claims 23-43. Furthermore, the aforementioned comments do not sufficiently describe the steps recited in claims 23-43.

Response to Arguments

10. Applicant's arguments with respect to claims 1 and 12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**. The examiner can normally be reached on Mon-Friday (8:00AM-5: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm
May 28, 2003

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600